Section 3: Math and Science

This section addresses Math and Science standards. These two content areas are grouped together, as there is overlap of the knowledge and skills. This section correlates with the Kindergarten Curriculum Standards in Math and Science.

Math and Science for 0 through 4 months

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Problem Solving and Spatial Sense	Pays attention to what is happening in the environment	Looks at and reaches for toys	
				Shows excitement when seeing caregiver	
			Aware of surroundings; makes things happen, most often unintentionally	Gazes at own hands as they move about; waves arms to touch the dangling toy overhead	
	Science	Sensory Awareness, Observation and Exploration	Shows interest in surroundings by focusing on faces and objects in close range	Looks at surroundings in a new place	
				Explores objects placed in hands; brings objects to mouth; uses entire body to reach toward a toy	

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Problem Solving and Spatial Sense	Displays short term memory	Reaches toward objects and moves the object or himself to mouth or touch it	
				Turns head away when adult reaches out a wash cloth to wipe face	
				Looks for familiar person after she has left the room	
				Looks toward sky when an airplane is heard overhead	
			Makes things happen	Drops toy and looks for it; pulls a string attached to a toy, making it come closer and closer	
	Science	Sensory Awareness, Observation and Exploration	Attends to what is happening in the environment	Feels and explores objects	
				Bangs a block on the floor repeatedly, to hear the sound that it makes	
				Purposely pushes buttons on toy box, although sometimes still surprised at the results	
				Repeatedly turns an object over and listens to the sound the movement makes	

Math and Science for 9 through 12 months (9 months to 1 year)

Domain	Area of Learning	Components	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Problem Solving and Spatial Sense	Makes things happen through use of senses of sight, sound, taste, and touch	Begins to enjoy putting items in and getting items out of something	
				Explores and inspects the smallest details and objects (i.e. breadcrumbs, ants)	
				Searches for items that have been covered, placed inside something, or removed	
				Enjoys pulling things off shelves, out of cabinets, or baskets	
				Drops toy from high chair and waits for someone to pick it up	
				Tries to complete form board, pushing and pounding with determination	
	Science	Sensory Awareness, Observation and Exploration	Shows understanding of things in the environment during exploration	Opens certain drawers where they know there are toys	
				Points to familiar pictures in books	
				Pushes buttons on toy box waiting for clown to pop up	
				Begins to imitate familiar motions such as stirring	

Math and Science for 13 through 18 months (1year to 1-1/2 year)

Domain	Area of Learning	Components	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Problem Solving and Spatial Sense**	Begins to explore physical properties of objects and to identify their use	Attempts to imitate familiar actions of adults; puts key in keyhole, turns screwdriver	
				Stacks and then knocks down towers and stacks them up again	
				Places circle and square in form board	
				Explores small openings and looks for items to put in the opening, including fingers	
	Science	**Sensory Awareness, Observation and Exploration**	Uses all five senses to explore and understand surroundings	Begins to connect familiar activities with actions or pictures in books or magazines; builds on understanding while exploring the environment	
				Begins to mix, fill, and dump materials in containers	
				Pats, pushes, squishes and pounds play dough to experience how it feels	

Math and Science for 19 through 24 months (1-1/2 years to 2 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Problem Solving**	Begins to group objects by their function	Participates in dramatic play acting out familiar actions, feeding baby, cooking and eating	
			Begins to recognize objects as the same and different	Separates objects by single feature (*e.g* ., color)	
				Begins to match simple geometric forms such as circle, square, and triangle	
		Numbers	Begins to use number words in songs and finger plays with little or no understanding	Participates in singing songs and fingerplays that refer to counting or numbers (*5 Little Monkeys* , etc.)	
			Begins to build understanding of more	Asks for "more"	
		Spatial Sense to Develop Understanding of Conservation, Geometry and Numbers	Explores her world and begins to understand her position in space and how to get around	Fills a variety of containers with different materials, and dumps them	
				Moves through obstacle course going over, under, through, around, in and out	
				Explores new ways to make things go together, Legos, puzzles, shape toys, peg boards, etc.	

Math and Science for 19 through 24 months (1-1/2 years to 2 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	Sensory Awareness, Observation and Exploration	Expects specific results when playing with toys and other object	Builds with a variety of objects and begins to understand about balance, size and weight	
			Shows increased knowledge and memory for details and routines	Begins to build awareness of other people, places, and events	
				Participates in dramatic play, acting out familiar actions, feeding baby, cooking and eating	
				Goes to sink to wash hands when called for lunch or snack	

Math and Science for 25 through 30 months (2 years to 2-1/2 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Numbers**	Begins to build understanding of more, and one-to-one correspondence	Responds to "one" and "one more"; begins to count by imitation	
		Patterns	Begins to understand the relationship between objects, solving simple jigsaw puzzles and matching similar shapes	Begins to identify simple objects by their use, color and shape	
				Correctly stacks nesting cups, completes simple inset puzzles, and completes stacking ring in correct order through trial and error	
		Spatial Sense	Matches circle, square and triangle shapes	Uses trial and error to complete circle, triangle, square form board	
			Explores world, and understands position in space and how to get around	Understands how to climb up, go around, in, or through various spaces to get to or to reach an out of reach object	
		Problem Solving	Explores materials and understands simple acts of cause and effect	Begins to build simple block designs through trial and error	

Math and Science for 25 through 30 months (2 years to 2-1/2 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	**Sensory Awareness, Observation and Exploration**	Begins to build knowledge of the world through observation of surroundings	Explores ways to do things and demonstrates beginning understanding of concepts of color, shape size, matching, and weight	
		Sequencing and Time	Begins to understand consequences when re-creating events	Calls for adult to help settle a fight over a toy	
				Insists on putting on mittens before putting on coat	
			Demonstrates some understanding of when things happen in relation to routines	Imitates simple block structures and single-line crayon strokes	
				Chooses new shoes to wear when getting ready for special occasion	
		Problem Solving	Begins to use reasoning skills and imagination when planning ways to make things happen	Combines toys in complex ways to represent real objects, such as using play dough in the dramatic play area to represent food	
				Looks outside at the newly fallen snow and runs to get on boots and mittens	
				Makes up stories when building with unit blocks, or while coloring	
				Begins to act out familiar stories	

Math and Science for 31 through 36 months (2-1/2 years to 3 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Numbers**	Continues to build understanding of quantity and size	Makes requests for "more" in a variety of situations; begins to compare size by using words such as big, little, small	
			Begins to count by rote	Participates in songs and finger plays involving counting	
		Patterns	Continues to understand the relationship between objects, solving simple jigsaw puzzles and matching similar shapes	Completes 3-4-piece puzzles	
				Begins to point out the differences in objects rather than the similarities	
				Matches more complex shapes such as hexagon, trapezoid, etc.	
		Spatial Sense	Explores world and understands position in space and how to get around	Responds with accuracy most of the time when asked to put the blocks "on" the table, or to go "under" the table	
		Problem Solving	Explores materials and understands simple acts of cause and effect	Builds simple block designs with some understanding of larger, heavier blocks go on the bottom and smaller light-weight blocks go on top	

Math and Science for 31 through 36 months (2-1/2 years to 3 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	**Sensory Awareness, Observation and Exploration**	Builds knowledge of the world through observation and awareness of surroundings.	Shows curiousity and asks questions about the environment; is more interested in trial and error	
		Sequencing and Time	Begins to understand consequences when re-creating events	Understands the need for a coat for warmth when it is cold outside	
			Demonstrates some understanding of when things happen in relation to routines	Begins to make connection between daily events and what happens "next" (after lunch it is time for a nap)	
		Problem Solving	Uses reasoning skills and imagination when planning ways to make things happen	Describes drawing made after trip to the fire station	
				During dramatic play, encourages peer to blow on food that is "hot"	

Math and Science for 37 through 48 months (3 years to 4 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Number and Operations**	Begins to identify and label objects using numbers	Counts a collection of 1-4 items and begins to understand that the last counting word tells how many	
				Can quickly "see" and label a group of objects of one to three with a number	
				Begins to make use of one-to-one correspondence in counting objects and matching groups of objects	
		Patterns and Algebra	Explores and begins to sort and classify objects	Begins to sort objects on the basis of one dimension, color, size, shape	
			Begins to identify, describe, and extend patterns	Begins to recognize, duplicate and create patterns	
				Begins to place objects in order through trial and error	
		Measurement	Begins to demonstrate understanding of time, length, weight,capacity and temperature	Recognizes and labels measurable characteristics of objects (*e.g* ., "I need the long string.")	
				Uses approximate measures of familiar objects using nonconventional measuring tools	
				Begins to use conventional measurement terms (mile, age span, month, cup,etc) without accuracy	
				Understands time as a sequence of events that relates to her daily life	

Math and Science for 37 through 48 months (3 years to 4 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Geometry and Spatial Sense	Becomes aware of his body and personal space during active exploration of physical environment	Begins to build mental and physical maps of their surroundings	
				Responds to "Put it beside," or "Put it under"	
				Explores geometric shapes using their hands, eyes and mind.	
			Begins to explore the size, shape, and spatial arrangement of real objects	Notices and copies simple repeating patterns, such as a wall of blocks with long, short, long, short,….	
				Begins to notice different shapes and identifies big and small shapes	
		Problem Solving and Analyzing Data	Begins to develop foundation for linking concepts and procedures with active experiences	Sorts objects and counts and compares the groups formed	
				Builds simple structures with blocks	

Math and Science for 37 through 48 months (3 years to 4 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	**Life Science**	Observes surroundings in relation to knowledge and methods about life science	Understands new information and begins to explore more complex situations and concepts	
				Expands knowledge of and respect for their body and the environment	
				Expands knowledge of and abilities to observe, describe, and discuss the natural world, materials, living things, and natural processes	
		Earth and Space Science	Understands sequencing and time in relation to knowledge and methods about Earth and space	Understands the sequence of daily events	
				Demonstrates some understanding of duration of time, "all day", "for two days"	
		Physical Science	Solves problems in relation to knowledge and methods about energy	Begins to participate in simple investigations to test observations, discuss and draw conclusions, and form generalizations	
				Thinks about a problem and figures out what to do	

Math and Science for 49 through 60 months (4 years to 5 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Number and Operations	Begins to identify and label objects using numbers	Develops increased abilities to combine, separate and name "how many" concrete objects	K.1.1
			Develops understanding of numbers and their association with objects	Begins to associate number concepts, vocabulary, quantities, and numerals in meaningful ways	K.1.2
				Develops increasing ability to count in sequence to 10 and beyond	K1.1
		Patterns and Algebra	Explores and begins to sort and classify objects	Shows understanding of and uses comparative words	K.1.3
				Groups common related objects: shoe, sock, foot: apple, orange, plum	K 2.1a K 2.2a
			Identifies, describes, and extends patterns	Copies repeating patterns and begins to construct own patterns	K.4.2
		Measurement	Begins to demonstrate understanding of time, length, weight, capacity and temperature	Constructs a sense of time as it relates to his daily life	K.4.1
				Participates in measuring activities using conventional and nonconventional measuring tools	K.2.1
				Uses conventional measurement, time, and money terms with some accuracy	

Math and Science for 49 through 60 months (4 years to 5 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Spatial Sense and Geometry**	Becomes aware of personal space during active exploration of physical environment	Builds an increasing understanding of directionality, order, and positions of objects, and words such as up, down, over, under, top, bottom, inside, out-side, in front, and behind	K.3.2
			Explores and recognizes the size, shape, and spatial arrangement of real objects	Identifies and labels several shapes (*e.g.*, circle, square, triangle, rectangle)	K.3.1
		Problem Solving and Analyzing Data	Begins to develop foundation for linking concepts and procedures with active experiences	Demonstrates increasing interest and awareness of numbers and counting as a means for solving problems and determining quantity	K.1.3

Math and Science for 49 through 60 months (4 years to 5 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	Life Science	Recognizes that living things are made up of parts	Begins to make comparisons among living things such as flowers, insects and animals	K.1.1
			Recognizes that people use their 5 senses to explore their environment	Expands knowledge of and abilities to observe, describe and discuss the natural world, materials, living things and natural processes	K.2.2
			Recognizes that living things live in different environments	Expands knowledge of and respect for her body and the environment	K.5.2
		Earth and Space Science	Recognizes the concept of day and night	Continues to asks questions about the natural world and seeks answers through active exploration	K.7.1
			Recognizes daily weather conditions		K.8.1
			Recognizes that time and temperature can be measured with a clock and thermometer		K.8.2
			Recognizes a variety of earth materials by their observable properties (rocks, sand, dirt)	Begins to use senses and a variety of tools and simple measuring devices to gather information, investigate materials and observe processes and relationships	K.10.1
			Classifies materials by their elements	Develops increasing abilities to classify, compare and contrast objects, events and experiences	K.10.2

Math and Science for 49 through 60 months (4 years to 5 years)

Domain	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	Physical Science	Recognizes the basic concept that forces can move objects.	Begins to participate in simple investigations to test observations, discuss and draw conclusions and form generalizations	K.11.1
			Recognizes that objects have observable properties that can change over time and under different conditions	Develops growing abilities to collect, describe and record information through a variety of means, including discussion, drawing, maps and charts	K.12.1
			Recognizes that the sun gives us light	Begins to describe and discuss predictions, explanations and generalizations based on past experiences	K.14.1
			Recognizes that sound is produced when two objects collide	Uses senses to observe and explore classroom materials and natural phenomena.	K.14.2